

Small terrestrial ground-beetles of the Amazon Basin
(Coleoptera: Bembidiini: Tachyina and Anillina)

by

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Abstract

Five new species and one new genus are described for the purpose of providing names for species in ecology studies of small terrestrial ground-beetles in Amazonian Brazil and Peru. The taxa are as follows: *Moirainpa amazona*, new genus, new species, BRAZIL, Amazonas, Manaus vcn., Rio Solimões, Curari Island, 03° 15'S 59° 49'W; *Polyderis moira*, *P. ucavali*, and *P. nympha* new species, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis, 09° 37'S 74° 56'W; *P. terra*, BRAZIL, Para, Utinga tract near Belém, 01° 27'S 48° 29'W. A key is provided for their identification and distributions of the taxa summarized.

Keywords: Carabidae, Tachyina, Amazon.

Introduction

In order to provide names for species in the present ecology studies, ADIS & PAARMANN invited me to describe forms collected by various people in the Amazon Basin. My studies of these small terrestrial ground-beetles has not reached the stage where I am ready to monograph the groups included here, so I have chosen to simply describe them briefly and provide names in advance of a larger, more comprehensive study. The material included here comes mainly from Drs. HANAGARTH (Panguana Biological Station, Peru) and ADIS (Manaus, Brazil).

Taxonomy

Genus *Moirainpa* ERWIN, new genus

Type-species: *Moirainpa amazona*, new species, here designated.

Diagnostic Combination: Form subdepressed; body pubescent, eyes with few very large facets, pubescent; frons with two short deep furrows which are medially directed; dorsum without carinae; labrum truncate, not covering mandibles, mentum without foveae; anterior tibia markedly notched apicolaterally; elytra entire, humeral margin serrate, recurrent groove absent; color testaceous.

Natural History: Many examples of this species were collected by ADIS using the so-called 'Arboreal Photoeclector'. This type of trap consists of cloth funnels which surround a tree trunk. They were used in White and Black water inundation forests near Manaus and collections were made as listed below. All *Moirainpa* specimens were collected in White water traps.

Notes: This species provides an example of what I proposed earlier (ERWIN 1982) with regard to the derivation of "Anillina" from tachyines. The present species has eyes (although rudimentary), but at the same time many characteristics of the Anillina; it also has some features one would expect in a very primitive *Lymanis* species, thus it appears that an intermediate stage of tachyine/anilline evolution is here preserved and it warrants further study.

The genus name is feminine.

In ERWIN (1978), these beetles will key to step 8 for which I here provide a revision:

8 (6') Claws denticulate; elytral recurrent groove elongate, straight, and very close to side margin (northern Canada through Belize, Antilles, Old World) *Tachyta* KIRBY, 1837

8' Claws simple; elytral recurrent groove absent, or short and arcuate, and usually closer to suture than side margin 8a

8a (8') Form convex or subdepressed; body glabrous; elytral recurrent groove short and arcuate *Elaphropus* MOTSCHULSKY, 1839

8a' Form depressed; body pubescent; elytral recurrent groove absent . *Moirainpa* ERWIN, new genus

Moirainpa amazona, new species

(Figure 1)

Diagnostic Combination: Form subdepressed (Fig. 1); body pubescent, eyes with few very large facets, pubescent; dorsum without carinae; labrum truncate, not covering mandibles, mentum without foveae; anterior tibia markedly notched apicolaterally; elytra entire, humeral margin serrate, recurrent groove absent. **Color and luster:** testaceous; surface shiny. **Form:** subdepressed; head very broad; antennomeres large, moniliform. **Structure:** frontal furrows markedly impressed, convergent in front of eyes; pronotum broad (Fig. 1), with anterior setae far forwards; elytra slightly tapered toward apex.

Size: ABL = 1.0 mm.

Distribution: These beetles are known from the upper Amazon drainage from the Pucallpa area of Peru, east to Manaus, Brazil. It is probable, based on their habitat, that they are extensively distributed over the entire Basin.

Natural History Notes: In the White water inundation forests along the Rio Solimões, south of Manaus, ADIS repeatedly collected these beetles from arboreal photoeclector traps mounted on tree trunks as well as during canopy fogging (see ADIS 1981, for complete description of site, and ADIS 1982, for phenology of species). Specimens were collected in May and July through December, 1976.

Type-Material: Holotype female, BRAZIL, Amazonas, Manaus vcn., Rio Solimões, Curari Island, 03° 15'S 59° 49'W, (ADIS) (INPA). Paratypes: 185 males and females, same locality as type.

Additional material: 1, ? sex, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis, 09° 37'S 74° 56'W, (HANAGARTH) (USNM).

Genus *Polyderis* MOTSCHULSKY

Polyderis MOTSCHULSKY, 1862:27. Type-species: *Tachys brevicornis* CHAUDOIR, 1846:193; subsequent designation by JEANNEL, 1941:424.

Polyderidius JEANNEL, 1962:611. Type-species: *Polyderidius rappoportii* JEANNEL, 1962:612, original designation. ERWIN, 1974:143.

Diagnostic Combination: Head with two or three supraorbital setae; mentum with 2 foveae, each circular in outline or U-shaped, and variously impressed; pronotum with hind angles; anterior tibia deeply notched apicolaterally; elytral interneurs effaced or very shallowly striate; recurrent groove either absent, almost effaced, or short, arcuate, and recurved, and nearer suture than side margin; interneur 8 entire, or at least present anteriorly and posteriorly; form small and depressed or subdepressed; color testaceous or flavus.

Natural History: These beetles live in a variety of habitats from stream margins to ant nests (facultative), but most are deep litter forms in wet or damp parts of forests.

Geographical Distribution: Members of this genus are found throughout most areas of the world.

Notes: With new techniques of collecting, for example berlese funnels, ground and arboreal photoeclectors, and sifting, numerous new species of this genus will be discovered. I also recently described a species from Chiapas amber (ERWIN 1971). Those described below are a further example of what is to be expected. The genus *Polyderis* has many components which may be ranked at the subgeneric level or even as new genera when the group is completely revised. For the present, I chose to follow LINDROTH's example and place the following new forms in species groups within *Polyderis*. JEANNEL's *Polyderidius* refers to species which have three supraorbital setae on each side, a character state of all those described below.

Key to species of *Polyderis* of the Amazon Basin

- 1 Recurrent groove of elytron long, extended to level of discal seta Ed5 2
- Recurrent groove of elytron short, extended only half the distance from apex to seta Ed5 3
- 2 Prothorax very small in relation to head, pronotum barely wider than head and markedly constricted behind 1. *P. moira* ERWIN, new species
- Prothorax larger than head, pronotum much wider than head and subcordate behind 2. *P. terra* ERWIN, new species
- 3 Recurrent groove of elytron recurved; body large and broad, pronotum much broader than head; color evenly castaneous 3. *P. ucayali* ERWIN, new species
- Recurrent groove of elytron not recurved; body slight and narrow, pronotum barely broader than head; color of pronotum nearly white, head and elytra testaceous 4. *P. nymphe* ERWIN, new species

The *terra* group

Diagnostic Combination: Head with three supraorbital setae; recurrent groove of elytron extended anteriorad to discal seta Ed5.

These beetles are known from the Amazon Basin around the Belém area in the east, at Manaus, Brazil, and in the Ucayali River drainage system near Pucallpa, Peru, in the west; it is highly likely that these beetles will be collected throughout the Basin eventually.

1. *P. moira* ERWIN, new species
(Figures 2, 6a)

Diagnostic Combination: Recurrent groove of elytron long, extended to level of discal seta Ed5 (Fig. 6a). Prothorax (Fig. 2) very small in relation to head, pronotum barely wider than head and markedly constricted behind. **Color and luster:** head and elytra flavus, pronotum almost white; surface shiny. **Form:** small and slight, forebody very narrow, especially prothorax in relation to head; elytron with prominent humerus, sutural angle oblique, apex broadly rounded. **Structure:** mentum with two deep, well defined foveae; eyes very small, prominent, with large facets; pronotum with two pairs of setae; elytral margin with large foveae at base of humeral setal group Eol-4. **Size:** ABL = 0.9 mm.

Distribution: These beetles are known from the upper Amazon drainage from the Pucallpa area of Peru, east to Manaus, Brazil. It is probable, based on their habitat, that they are extensively distributed over the entire Basin.

Natural History Notes: See HANAGARTH (1979), ADIS (1981). In the Black water inundation forests along the Rio Negro, north of Manaus, ADIS repeatedly collected these beetles from photoeclector emergence traps placed over litter (see ADIS 1981, for complete description of site). Specimens were collected by ADIS in December, 1975 through March, 1976 and September, 1976 through April, 1977.

Type-Material: Holotype female, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis, 09° 37'S 74° 56'W, (HANAGARTH) (USNM). Paratypes: 58 males and females, same locality as type.

Additional material: 157 males and females, BRAZIL, Amazonas, Manaus vcn., Tarumã Mirim River, 03° 02'S 60° 17'W, (ADIS) (INPA, USNM).

2. *P. terra* ERWIN, new species (Figure 3)

Diagnostic Combination: Recurrent groove of elytron long, extended to level of discal seta Ed5. Prothorax larger than head (Fig. 3), pronotum much wider than head and subcordate behind. **Color and luster:** flavous; surface shiny. **Form:** small and broad, forebody broad, pronotum wider than head, subcordate; elytron with square humerus, sutural angle oblique, apex broadly rounded. **Structure:** mentum with two deep, well defined foveae; eyes moderately small, prominent, with large facets; pronotum with two pairs of setae; elytral margin with moderately large foveae at base of humeral setal group Eol-4. **Size:** ABL = 1.0 mm.

Distribution: Known only from the type locality.

Natural History Notes: Nothing is known about the habitat of this species.

Type-Material: Holotype male, BRAZIL, Para, Utinga tract near Belém, 01° 27'S 48° 29'W, August (P. F. DARLINGTON) (MCZ).

The *rappporti* group

Diagnostic Combination: Head with three supraorbital setae; recurrent groove of elytron not extended to discal seta Ed5.

These beetles are distributed from Argentina to Mexico, one species is known from the West Indies and another from Hawaii. Two species are now known from the Basin, but it likely many more will be discovered in the western and northern uplands. *P. rappporti* JEANNEL was described from Argentina and I have seen other new species from Mato Grosso and Nova Teutonia, Brazil.

3. *P. ucayali* ERWIN, new species (Figures 4, 6b)

Diagnostic Combination: Recurrent groove of elytron short (Fig. 6b), extended only half the distance from apex to seta Ed5, apex of groove recurved; body large and broad, pronotum much broader than head (Fig. 4); color evenly pale castaneus. **Color and luster:** pale castaneus; surface shiny. **Form:** small and very broad, forebody broad, pronotum much wider than head, subcordate; elytron with slightly prominent humerus, sutural angle slightly oblique, apex broadly rounded. **Structure:** mentum with very shallow, poorly defined foveae; eyes moderately small, prominent, with large facets; pronotum with two pairs of setae; elytral margin with medium-sized foveae at base of humeral setal group Eol-4. **Size:** ABL = 1.2 mm.

Distribution: These beetles are known from the upper Amazon drainage from the Pucallpa area of Peru, east to Manaus, Brazil. It is probable, based on their habitat, that they are extensively distributed over the entire Basin.

Natural History Notes: See HANAGARTH (1979), ADIS (1981). In the Black water inundation forests along the Rio Negro, north of Manaus, ADIS repeatedly collected these beetles from photoeclector emergence traps placed over litter (see ADIS 1981, for complete description of site). Specimens were collected by ADIS in March, 1976 and March, 1977.

Type-Material: Holotype male, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis, 09° 37'S 74° 56'W, (HANAGARTH) (USNM). Paratype: 1 male, same locality as type.

Additional material: 10 males and females, BRAZIL, Amazonas, Manaus vcn., Tarumã Mirim River, 03° 02'S 60° 17'W, (ADIS) (INPA, USNM).

4. *P. nympha* ERWIN, new species (Figure 5)

Diagnostic Combination: Recurrent groove of elytron short, extended only half the distance from apex to seta Ed5. Recurrent groove of elytron not recurved; body slight and narrow, pronotum (Fig. 5) barely broader than head; color of pronotum nearly white, head and elytra testaceous. **Color and luster:** pronotum nearly white, head and elytra testaceous; surface shiny. **Form:** body slight and narrow, pronotum barely broader than head; elytra moderately large, rectangulate, humerus square. **Structure:** mentum with very shallow, poorly defined foveae, each U-shaped; eyes moderately small, prominent, with large facets; pronotum with two pairs of setae; elytral margin with medium-sized foveae at base of humeral setal group Eol-4; male sternum VI with serrate apical margin. **Size:** ABL = 1.1 mm.

Distribution: These beetles are known from the upper Amazon drainage from the Pucallpa area of Peru, east to Manaus, Brazil. It is probable, based on their habitat, that they are extensively distributed over the entire Basin.

Natural History Notes: See HANAGARTH (1979), ADIS (1981). In the Black water inundation forests along the Rio Negro, north of Manaus, ADIS repeatedly collected these beetles from photoeclector emergence traps placed over litter (see ADIS 1981, for complete description of site). Specimens were collected by ADIS in December, 1975 through March, 1976 and September, 1976 through April, 1977.

Type-Material: Holotype female, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis, 09° 37'S 74° 56'W, (HANAGARTH) (USNM). Paratypes: 184 males and females, same locality as type.

Additional material: 1203 males and females, BRAZIL, Amazonas, Manaus vcn., Rio Negro, 03° 02'S 60° 17'W, (ADIS) (INPA, USNM).

Resumo

Cinco novas espécies e um novo gênero são descritos com a finalidade de providenciar nomes para espécies em pesquisas ecológicas de besouros terrestres na Amazônia Brasileira e Peruana. Os taxa são os seguintes: *Moirainpa amazona*, novo gênero, nova espécie, BRASIL Amazonas, Manaus próximo do Rio Solimões, Ilha do Curari, 03° 15'S 59° 49'W; *Polyderis moira*, *P. ucayali*, e *P. nympha* novas espécies, PERU, Huánuco, Panguana Estación Biológica del Panguana, Rio Yuyapichis, 09° 37'S 74° 56'W, *P. terra*, BRAZIL, Para, Utinga área próxima de Belém, 01° 27'S 48° 29'W. Uma chave é providenciada para identificação e distribuição dos taxa sumarizados.

References

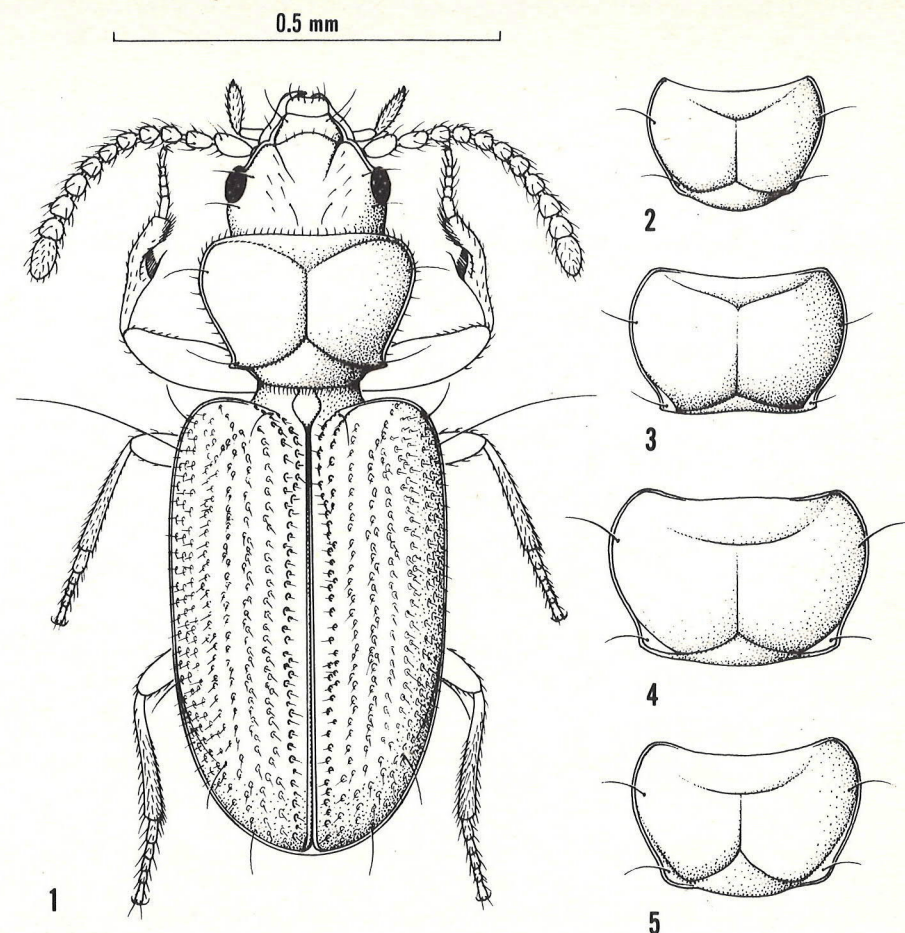
- ADIS, J. (1981): Comparative ecological Studies of the terrestrial arthropod fauna in Central Amazonian Inundation Forests.- Amazoniana 7: 87 - 173.
ADIS, J. (1982): Zur Besiedlung zentralamazonischer Überschwemmungswälder (Várzea-Gebiet) durch Carabiden (Coleoptera).- Arch. Hydrobiol. 95 (1/4): 3 - 75.
CHAUDOIR, M. DE (1846): Énumération des Carabiques et *Hydrocanthares recueillis* pendant un voyage au Caucase.- Kiew: p. 1 - 268.
ERWIN, T. L. (1971): Fossil Tachyine Beetles from Mexican and Baltic amber with notes on a new synonymy of an extant group (Col., Carabidae).- Ent. Scand. 2 (3): 233 - 236.
ERWIN, T. L. (1974): Studies of the subtribe Tachyina (Coleoptera: Carabidae: Bembidiini) Supplement A: Lectotype designations for New World species, two genera, and notes on generic concepts.- Proc. Ent. Soc. Washington 76: 123 - 155.

- ERWIN, T. L. (1978): Studies of the subtribe Tachyina (Coleoptera: Carabidae: Bembidiini) Supplement C: Discovery of the sister group of *Mioptachys* Bates, in the Amazon Basin – *Inpa psydroides* a new genus and species.- Coleopt. Bull. 32 (1): 29 - 36.
- ERWIN, T. L. (1982): Small terrestrial ground-beetles of Central America (Carabidae: Bembidiina and Anillina).- Proc. California Acad. Sci. 42 (19): 455 - 496.
- HANAGARTH, W. (1979): Vergleichend-ökologische Untersuchungen an epigäischen Arthropoden aus Naturbiotopen und Kulturland im tropischen Regenwald Perus. Ein Beitrag zur Agrarökologie der Tropen.- Diss. Hamburg: 240 p.
- JEANNEL, R. (1941): Faune de France 39. Coléoptères Carabiques.- Paris 1: 571 p.
- JEANNEL, R. (1962): Les Trechides de la Palearctide Occidentale.- Biologie de l'Amérique Australe études sure la faune de Sol, Paris 7: 529 - 655.
- KIRBY, W. (1837): The Insects. In: J. Richardson (ed.): Fauna Boreali-Americana 4. Norwick: 1 - 325.
- MOTSCHULSKY, T. V. DE (1839): Coléoptères du Caucase et des provinces Transcaucasiennes décrits par T. Victor.- Bull. Soc. Imp. Nat. Moscow 12: 68 - 93.
- MOTSCHULSKY, T. V. DE (1862): Etudes entomologiques 11, Dresden: p. 1 - 55.

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Figs. 1 - 5:

1: Habitus, dorsal aspect, of *Moirainpa amazona*, BRAZIL, Amazonas, Manaus vcn., Rio Solimões, Curari Island; 2 - 5: Pronotum, dorsal aspect. 2: *Polyderis moira*, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis; 3: *Polyderis terra*, BRAZIL, Para, Utinga tract near Belém; 4: *Polyderis ucayali*, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis; 5: *Polyderis nympa*, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis.

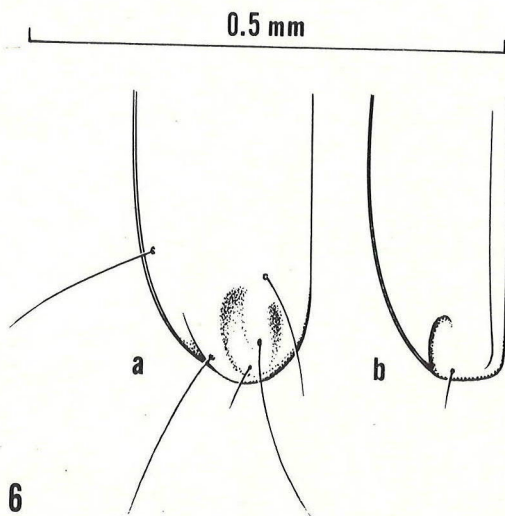


Fig. 6:
Recurrent groove of elytral apex, dorsal aspect. **a:** *Polyderis moira*, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis; **b:** *Polyderis ucayali*, PERU, Huanuco, Panguana Biological Station, Rio Yuyapichis.